

Before the
Federal Communications Commission
Washington, D.C. 20554

DOCKET FILE COPY ORIGINAL

RECEIVED

FEB 17 2000

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
The Establishment of Policies)
and Service Rules for the Mobile Satellite)
Service in the 2 GHz Band)

IB Docket No. 99-81
DA 00-222

SUPPLEMENTAL COMMENTS

Constellation Communications Holdings, Inc. ("Constellation"),¹ by counsel, hereby submits these Supplemental Comments in response to the Commission's Public Notice (DA 00-222) ("*Supplemental Notice*") released February 7, 2000 in the proceeding captioned above.²

Constellation previously filed *Comments* and *Reply Comments*³ supporting the general objectives of the Commission's proposals in its Notice of Proposed Rule Making⁴ ("*Notice*") to accommodate all of the pending proposals for authorization of mobile satellite service ("MSS") systems in the 2 GHz band. In particular, Constellation

¹ Constellation is licensed by the Commission to construct a 1.6/2.4 GHz MSS system. See *Constellation Communications, Inc.*, DA 97-1366, released July 1, 1997, and has filed an application for a 2 GHz MSS system. See Application of Constellation Communications, Inc., File Number 181-SAT-P/LA-97(46). This application was initially filed in the name of Constellation Communications, Inc. ("CCI"). On December 30, 1999, CCI submitted a pro forma amendment to its pending application to assign the application to Constellation.

² See FCC Public Notice, DA 00-222, released February 7, 2000.

³ See Comments filed June 24, 1999 and Reply Comments filed July 26, 1999 in IB Docket No. 99-81 submitted by Constellation.

⁴ See Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band, IB Docket No. 99-81, 14 FCC Rcd 4843 (1999).

No. of Copies rec'd 024
List A B C D E

recommended a combination of elements of the various licensing approaches and service rules proposed in the *Notice* to provide the necessary flexibility for all of the pending applicants to efficiently implement their systems.

The fairness, efficiency and flexibility of the Commission's 2 GHz MSS licensing procedures will depend greatly on the specific details of the rules to be adopted. However, the Commission's *Supplemental Notice* provides only a broad overview of the Commission's hybrid assignment approach. Insufficient details and time to properly analyze this approach and evaluate its consequences have been provided to the parties in this proceeding. Nevertheless, based on its initial understanding of the Commission's proposal in the *Supplemental Notice*, Constellation believes that the Commission's proposed hybrid approach may offer a basis for practical resolution of this proceeding. However, at a minimum, the additional provisions discussed below are required to improve its administration, achieve efficient spectrum utilization, and provide fair treatment of all applicants.

I. The Assignment Of An Equal Amount Of Spectrum To Each Of The Pending Applicants Is An Appropriate Basis For The 2 GHz MSS Assignment Plan If Additional Provisions Are Included To Clarify Its Implementation

Constellation previously expressed its concerns with frequency assignment plans which left the minimum amount of spectrum assigned to an applicant subject to uncertain future events.⁵ The *Supplemental Notice* proposal to divide the 2 GHz MSS bands into equal segments with each operator selecting one of these segments as its "home"

⁵ These concerns were raised by the Flexible Band Management and Negotiated Entry Approach. See Constellation Comments at 7-21.

assignment addresses these concerns. In addition, the “first come” approach to frequency band selection and assignment appears to be a straightforward approach to the assignment of a specific band segment to each of the pending applicants. However, the “first come” approach does raise some concerns regarding fairness and spectrum efficiency which should be addressed by the Commission in the specific rules to be adopted.

Terrestrial Relocation. The proposed 2 GHz MSS systems will be implemented over a period of several years. The first operational system to select its “home” began construction several years ago under authority issued by another country, and the construction of United States systems is not expected to begin until after this proceeding is completed. It is not clear whether the relocation costs associated with each of the band segments will be similar or whether there will be large differences in the relocation costs associated with each of the band segments. If there are large differences in relocation costs, system operators who begin implementing their systems after the conclusion of this proceeding should not be penalized by allowing initial entrants not similarly constrained to pick the band segments with the lowest relocation costs. Instead, the relocation cost mechanism under such a “first come” assignment approach should recognize that not all system operators are equally situated with respect to their ability to time the selection of their “home” spectrum.

Geostationary MSS Systems. The 2 GHz MSS allocations in the United States are divided into bands that are allocated for MSS only in Region 2 and bands that are allocated in all three ITU Regions.⁶ Non-geostationary MSS systems are inherently

⁶ See Notice at para. 28. Constellation Comments at 8-9.

global in scope and require spectrum that is available in all three ITU Regions. On the other hand, geostationary MSS systems authorized to serve the United States use satellites that are inherently regional in coverage and can effectively utilize the bands allocated only in Region 2 for this service. Consequently, the home spectrum of any geostationary MSS system should be limited to the Region 2 MSS allocations.

Feeder Link Coordination. The hybrid assignment approach described in the *Supplemental Notice* does not address feeder link issues. Accommodation of the 2 GHz MSS systems will require additional sharing of the existing feeder link bands including sharing with systems holding licenses for 1.6/2.4 GHz MSS systems. The “first come” approach to selection of 2 GHz MSS service link frequencies should not be allowed to prevent access to feeder link bands by earlier licensed 1.6/2.4 GHz MSS systems, and all 2 GHz MSS systems should have equal status in the coordination of their feeder links regardless of their planned implementation dates.⁷

Coordination of Operating Frequencies. The Commission indicates that 2 GHz MSS systems would be authorized “to provide service anywhere in the 2 GHz MSS spectrum, subject to inter-system coordination.”⁸ However, it is not clear how conflicts would be resolved if two operators seek to use the same frequencies that are not part of their “home” assignment. While the concept of operation outside of the “home” spectrum assignment is desirable for the additional operational flexibility it provides, some

⁷ See also Constellation Comments at 21-22.

⁸ *Supplemental Notice* at 2.

guidelines or mechanism should be established to provide a basis for resolving conflicts.⁹

Operations Outside Of The United States. The *Supplemental Notice* does not address the operation of 2 GHz MSS systems outside of the United States. Although the Commission can enforce coordination among its licensees outside of the United States, the Commission should not allow systems licensed by other countries to take advantage of the Commission's rules by gaining an equal status with United States systems within this country and utilizing other procedures to obtain a preferred status over United States systems in other parts of the world. In addition, although the 1980-1990 MHz band is not available for MSS service within the United States, it is allocated to MSS on a worldwide basis. Since this band is available for use outside of the United States by 2 GHz MSS systems, the Commission should not allow its "first come" approach to assignment of "home" spectrum to serve the United States to inhibit access to this spectrum by United States systems outside of the United States. Consequently, as a condition of access to the United States market, 2 GHz MSS systems licensed by other countries should be required to coordinate their operations outside of the United States on the same basis as their operations within the United States.

⁹ A particular example that concerns Constellation is case of one or more narrowband time division multiple access ("TDMA") systems operating over several small but widely separated band segments selected to avoid terrestrial interference and a code division multiple access ("CDMA") system requiring a contiguous wideband segment for its operations which overlaps one or more of the narrowband TDMA segments. As discussed in Section II below, some mechanism is needed to ensure that CDMA systems can achieve spectrum efficiency by aggregating shared spectrum and utilizing different senses of polarization under the Commission's "first come" frequency assignment approach.

II. Additional Provisions Are Required To Achieve Efficient Spectrum Utilization Of The 2 GHz MSS Bands By CDMA Systems

The proposed hybrid approach appears to be particularly well suited to narrowband time division multiple access (“TDMA”) systems, such as proposed by the first likely operator of a 2 GHz MSS system. However, difficulties may arise when this approach is applied to code division multiple access (“CDMA”) systems.¹⁰

Shared Spectrum Aggregation. Two CDMA systems can easily share the same spectrum by using opposite sense of polarization, i.e. by one system using right hand circular polarization (“RHCP”) and the other using left hand circular (“LHCP”) polarization. Generally, it is not practical for non-CDMA MSS systems to share the same spectrum since the required carrier-to-interference ratio is difficult to achieve with the polarization isolation that can be provided by typical MSS user terminals. Thus, spectrum efficiency is improved if two CDMA systems are allowed to aggregate their “home” spectrum assignments into a contiguous band and then select opposite senses of circular polarization for their operations.

If the initial TDMA operators are allowed to arbitrarily select “home” spectrum on a first come basis, the initial few choices may so fragment the band that unnecessary costs are imposed on subsequent CDMA operators. For this reason, the “first come” approach to frequency assignment needs to be modified to include provisions for the later

¹⁰ For the purposes of these *Supplemental Comments*, Constellation distinguishes between CDMA systems seeking to aggregate shared spectrum so that one or more systems can operate with right hand circular polarization and one or more other systems can operate with left hand circular polarization. This approach will provide inter-system isolation. All other systems would be considered non-CDMA for this purpose, including systems employing a CDMA waveform but proposing operations with both senses of polarization in a service link. A CDMA system would be permitted to include TDMA waveforms on its assigned sense of polarization provided such use could be coordinated with the CDMA system(s) using the opposite sense of polarization.

modification of an initial “home” spectrum selection if the initial selection prevents such aggregation by a subsequent CDMA system. In addition, the first CDMA system operator should be allowed to select its “home” segment and to reserve an adjacent segment for the next CDMA system so that the two CDMA systems could aggregate their assignments over a contiguous 7.78 MHz band segment.¹¹ If there were no such adjacent band segments, the CDMA operator should be allowed to preempt the latest non-CDMA system operator selection in order to achieve an aggregated CDMA segment.¹²

Minimum Wideband CDMA Bandwidth. Another difficulty arises if a CDMA system desires compatibility with the types of wideband terrestrial CDMA air interfaces being contemplated for future wireless systems (e.g., IMT-2000). These CDMA waveforms have a minimum bandwidth of 2.5 MHz, and only a small number of carrier frequencies will be possible within the limited amount of “home” spectrum. Significant capacity penalties and inefficient spectrum use can result if the CDMA “home” spectrum assignment is not an integral multiple of the CDMA waveform bandwidth.

The initial amount of spectrum assigned to a systems under the Commission’s plan is 3.89 MHz in each direction of transmission. In synchronous CDMA systems, separate carrier frequencies are used by two feeder link earth stations when the beam overlaps the service areas of the two stations, and at least 5 MHz is needed under such

¹¹ If the 35 MHz MSS allocation in each of the uplink and downlink directions is divided equally among the nine pending applicants, each applicant would have access to 3.89 MHz of spectrum in each direction, and two such segments would have a bandwidth of 7.78 MHz.

¹² A similar approach should be available to the third, fifth, etc. CDMA system. It may be sufficient to initially limit this preemption to pairwise aggregation of two adjacent segments since the 7.78 MHz available from two adjacent segments is a reasonably good match to the 7.5 MHz required for three 2.5 MHz CDMA channels.

circumstances by a CDMA systems. Moreover, if two CDMA systems aggregate their spectrum on a shared basis, each would have 7.78 MHz on either RHCP or LHCP. For this reason, the Commission should not restrict a CDMA system to operate only over a bandwidth equal to its “home” assignment, as proposed in the *Supplemental Notice*, but should allow it to operate over a minimum of 7.78 MHz subject to inter-system coordination.

III. Additional Provisions Are Required To Preserve Options To Re-Assign Unused Spectrum Reserved For Applicants Who Fail To Meet System Implementation Milestones

Constellation continues to believe that the Commission’s 2 GHz MSS licensing approach should grant all pending applications that meet the Commission’s technical requirements, without requiring showing of financial qualifications, subject to implementation milestones reflecting the practical realities of financing satellite system construction.¹³ Recognizing that the market will determine which of the 2 GHz MSS applicants are ultimately successful, the initial designation of nine sub-bands should be reviewed after it has become apparent that one or more of the nine initial applicants will not implement their systems and the Commission has revoked their authorizations for failure to satisfy the required milestones.

Review and Re-Adjustment Of Home Spectrum Assignments. Flexibility has to be provided to the 2 GHz MSS applicants, especially those holding 1.6/2.4 GHz MSS licenses, to implement their proposed 2 GHz MSS systems in an economically rational

¹³ See Constellation Comments at 2-4.

manner.¹⁴ While the initial 2 GHz MSS assignment plan should accommodate all nine of the pending applications, procedures should be established for the automatic redistribution of spectrum to the remaining licensees in the event a licensee determines not to pursue its proposal or its license is cancelled by the Commission for failure to meet its milestone requirements. As noted above, the “first come” 2 GHz assignment approach and 3.89 MHz of “home” spectrum approach may result in spectrum inefficiencies over the long run, especially for CDMA systems, unless the Commission reserves a mechanism to review the initial selection of “home” frequencies. Some re-adjustments to these initial assignments may be required to achieve the most efficient spectrum utilization once the ultimate status of all of the proposed systems is determined by actual experience. Thus, the Commission should reserve the right to review the initial selection of “home” frequency assignments in the future, and to adjust the actual bands on which operations are conducted to achieve maximum spectrum efficiency, especially with respect to the aggregation of shared CDMA spectrum. This process would include the re-assignment of unassigned spectrum initially reserved for the licensees who do not actually implement their systems.

Design Flexibility. To maintain flexibility to conduct such a future review to achieve optimum spectrum utilization by the 2 GHz MSS systems that are actually implemented, the Commission should require that all 2 GHz systems (satellites, feeder link earth stations, and subscriber terminals) be capable of operating anywhere within the

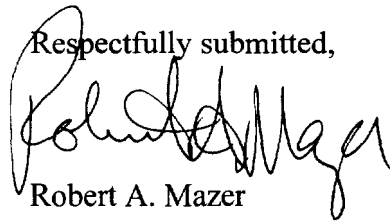
¹⁴ See Constellation Comments at 25-26.

2 GHz MSS allocations so that their design does not preclude future changes in “home” frequency assignments required to maximize spectrum efficiency.

Conclusion

Constellation believes that the approach described in the *Supplemental Notice* can form the basis for a practical resolution of this proceeding. However, there are numerous issues raised by the approach proposed in the *Supplemental Notice*, including the specific concerns identified above, which must be addressed in the rules to be adopted in this proceeding. Constellation believes that all of the pending applications can be granted in a way that preserves market flexibility while not unfairly benefiting or penalizing any of the applicants, and that the additional provisions described above and in Constellation’s earlier *Comments* and *Reply Comments* are necessary to achieve this objective.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert A. Mazer", written over the typed name.

Robert A. Mazer
Albert Shuldiner
Vinson & Elkins, L.L.P.
1455 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(202) 639-6500

Counsel for Constellation Communications,
Holdings, Inc.

Dated: February 17, 2000

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 17th day of February, 2000, a true and correct copy of the foregoing Supplemental Comments of Constellation Communications Holdings, Inc. was served by first class mail, postage prepaid, upon the following:

- | | |
|--|--|
| <p>* Mr. Roderick Kelvin Porter
Acting Chief, International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554</p> <p>* Ms. Fern J. Jarmulnek
Chief, Satellite &
Radiocommunication Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554</p> <p>* Ms. Cassandra Thomas
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554</p> <p>Mr. Bruce D. Jacobs
Mr. Glenn S. Richards
Fisher, Wayland, Cooper,
Leader & Zaragoza L.L.P.
2001 Pennsylvania Ave., N.W.
Suite 400
Washington, D.C. 20006-1851
Counsel for Personal
Communications Satellite Corporation</p> <p>* Mr. Alex Roytblat
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554</p> | <p>* Mr. Harold Ng
Engineering Advisor
Satellite & Radiocommunications
Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554</p> <p>* Mr. Thomas S. Tycz
Division Chief, Satellite &
Radiocommunication Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554</p> <p>Mr. Paul J. Sinderbrand
Mr. William W. Huber
Wilkinson, Barker, Knauer
& Quinn, L.L.P.
2300 N Street, N.W.
Washington, D.C. 20037-1128
Counsel for The Wireless Cable
Association International, Inc.</p> <p>Mr. Peter M. Connolly
Koteen & Naftalin, L.L.P.
1150 Connecticut Avenue
Washington, D.C. 20036
Counsel for TMI Communications
and Company, Limited Partnership</p> |
|--|--|

Ms. Cheryl A. Tritt
Mr. Charles H. Kennedy
Ms. Sheryl J. Lincoln
Morrison & Foerster L.L.P.
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006-1888
Counsel for ICO Services Limited

Ms. Jill Abeshouse Stern
Sr. Vice President and General Counsel
Mr. Gerald B. Helman
Vice President, International and
Governmental Affairs
Mobile Communications Holdings, Inc.
Two Lafayette Center
1133 Twenty-first Street, N.W.
Washington, D.C. 20036

Mr. Warren Grace
Director General
Inmarsat
99 City Road
London EC1Y 1AX
United Kingdom

Mr. John C. Quale
Ms. Antoinette Cook Bush
Skadden, Arps, Slate,
Meagher & Flom L.L.P.
1440 New York Avenue, N.W.
Washington, D.C. 20005-2111
Counsel for Celsat America, Inc.

David G. Frolio
1133 21st Street, N.W. Suite 900
Washington, DC 20036
Counsel for Bellsouth Corporation

Patricia A. Mahoney, SIA Chair
Clayton Mowry, Executive Director
The Satellite Industry Association
225 Reinekers Lane, Suite 600
Alexandria, VA 22314

Mr. Thomas J. Keller
Mr. Julian L. Shepard
Mr. Eric T. Werner
Verner, Liipfert, Bernhard,
McPherson, and Hand, Chartered
901 - 15th Street, N.W., Suite 700
Washington, D.C. 20005-2301
Counsel for Iridium L.L.C.

Mr. Joseph P. Markoski
Mr. Herbert E. Marks
Mr. David A. Nall
Mr. Bruce A. Olcott
Squire, Sanders & Dempsey L.L.P.
1201 Pennsylvania Avenue, N.W.
P. O. Box 407
Washington, D.C. 20044-0407
Counsel for The Boeing Company

Mr. William Wallace
Crowell & Moring
1001 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2505
Counsel for Globalstar, L.P.

Mr. Mark A. Grannis
Harris, Wiltshire & Grannis L.L.P.
1200 Eighteenth Street, N.W.
Washington, D.C. 20036
Counsel for Teledesic LLC

William B. Barfield
M. Robert Sutherland
David G. Richards
1155 Peachtree Street, N.E., Suite 1800
Atlanta, GA 30309-3610
Counsel for Bellsouth Corporation

Mr. Bruce Alberts
President
National Academies' Committee
on Radio Frequencies
Board on Physics and Astronomy
2101 Constitution Avenue, NW
Washington, DC 20418

Thomas E. Goode
Jeffrey L. Sheldon
UTC
1140 Connecticut Avenue, NW
Suite 1140
Washington, DC 20036

Alfred G. Richter, Jr.
Roger K. Toppins
John S. di Bene
One Bell Plaza, Room 3022
Dallas, TX 75202
Counsel for SBC Communications Inc.

Paul J. Sinderbrand
Wilkinson Barker Knauer, LLP
2300 N Street N.W.
Washington, DC 20037-1128
Counsel for The Wireless Communications
Association International, Inc.

Bobby D. Melvin
Director of Legal and Regulatory
Affairs
Bosch Telecom, Inc.
1125 E. Collins Blvd.
Richardson, TX 75081

Leonard R. Raish
Mitchell Lazarus
Fletcher, Heald & Hildreth, P.L.C.
1300 North 17th Street, 11th Floor
Arlington, VA 22209
Counsel for the Fixed Wireless
Communications Coalition

Philip L. Verveer
Angie Kronenberg
Sophie J. Keefer
Willkie Farr & Gallagher
1155 21st Street, N.W.
Washington, DC 20036-3384
Counsel for Winstar
Communications, Inc.

Thomas J. Keller
John M. R. Kneuer
Verner, Liipfert, Bernhard,
McPherson and Hand, Chartered
901 15th Street, NW Suite 700
Washington, DC 20005
Counsel for Association of
American Railroads

Mary McDermott
Chief of Staff and Senior Vice President,
Government Relations
Personal Communications Industry
Association
500 Montgomery Street, Suite 700
Alexandria, VA 22314-1561

Gary M. Epstein
John P. Janka
Arthur S. Landerholm
Latham & Watkins
1001 Pennsylvania Avenue, NW
Suite 1300
Washington, DC 20004
Counsel for Hughes Communications
Inc. and Hughes Communications
Galaxy, Inc.

Christopher D. Imlay
Booth, Freret, Imlay & Tepper
5101 Wisconsin Avenue, NW Suite 307
Washington, DC 20016
Counsel for Society of Broadcast
Engineers, Inc.

Bruce D. Jacobs
Stephen J. Berman
David S. Konczal
Fisher Wayland Cooper
Leader & Zaragoza LLP
Suite 400
2001 Pennsylvania Ave., NW
Washington, DC 20006
Counsel for Pegasus Development
Corp.

Robert M. Gurss
Wilkes, Artis, Hedrick & Lane,
Chartered
1666 K Street, NW Suite 1100
Washington, DC 20006
Counsel for Association of
Public-Safety Communications
Officials-International, Inc.

Robert L. James
Cole, Raywid & Braverman LLP
Suite 200
1919 Pennsylvania Avenue, NW
Washington, DC 20006
Counsel for Century OCN
Programming, Inc.

Tom Davidson, Esq.
Phil Marchesiello, Esq.
Akin, Gump, Strauss, Hauer
& Feld, LLP
1333 New Hampshire Avenue NW
Suite 400
Washington, DC 20036
Counsel for Mobile Communications
Holdings, Inc.

Cheryl A. Tritt
Charles H. Kennedy
Morrison & Foerster LLP
2000 Pennsylvania Avenue NW
Washington, DC 20006-1888
Counsel for ICO Services Limited

Kathy Smith
Acting Chief Counsel
National Telecommunications and
Information Administration
U.S. Department of Commerce
Room 4713
1401 Constitution Avenue NW
Washington, DC 20230

Joseph D. Hersey, Jr.
Chief, Spectrum Management Division
Commandant (G-SCT-2)
United States Coast Guard
2100 Second Street NW
Washington, DC 20593-0001

Kelly Cameron
Robert L. Galbreath
Powell Goldstein Frazer
& Murphy LLP
1001 Pennsylvania Avenue NW
Sixth Floor
Washington, DC 20004
Counsel for Inmarsat Ltd.

Robert M. Nutwell, RADM, USN
Deputy Assistant Secretary of Defense
Office of the Assistant Secretary of
Defense
6000 Defense Pentagon
Washington, DC 20301-6000

John L. Bartlett
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, DC 20006-2304
Counsel for Aeronautical Radio, Inc.

Thomas E. Goode
Jeffrey L. Sheldon
UTC
1140 Connecticut Avenue, N.W.
Suite 1140
Washington, DC 20036
Counsel for UTC

